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CENTRAL INTELLIGENCE AGENCY  
INFORMATION FROM

REPORT

50X1-HUM

**FOREIGN DOCUMENTS OR RADIO BROADCASTS**

CD NO.

COUNTRY	USSR
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DATE OF INFORMATION 1948

**SUBJECT** Scientific - Motorcycle design

HOW PUBLISHED Monthly periodical

DATE DIST. *24* Jun 1949

WHERE  
PUBLISHED **MOSCOW**

NO. OF PAGES 2

DATE  
PUBLISHED Dec 1948

LANGUAGE Russian

SUPPLEMENT TO  
REPORT NO.

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SOURCE                      Automobil', No 12. 1948.

**RECORD-BREAKING SOVIET MOTORCYCLE**  
**USES SPECIAL SUPERCHARGER**

V. Bekman

Designer Shumilkin built his Kometa 2 motorcycle in 1946, in which year he established a record of 174.4 kilometers per hour for the 500-, 750-, and 1,000-cubic-centimeter classes. His record speed in the dead start run was 119.9 kilometers per hour for the 500- and 750-cubic-centimeter classes.

In 1948, Shumilkin beat his own records in both the running and dead start events, with speeds of 175.9 kilometers per hour and 130 kilometers per hour, respectively. His average acceleration in the dead start event was 2.6 meters per second per second.

The designer's 1948 winner had a 500-cubic-centimeter engine in place of the previous 1,200-cubic-centimeter engine.

While some parts of the Kometa 2 are borrowed from the M-72, the Kometa's cylinders, pistons, valves, and some other parts are either specifically constructed for it, or are considerably modified.

The Kometa 2 has a horizontal twin-cylinder engine with cam-shaft actuated overhead valves. The bore and stroke are 68 millimeters and the displacement 500 centimeters. The engine develops 40 - 41 horsepower at 7,000 revolutions per minute, with a compression ratio of 7.

The special supercharger, designed by Shumilkin, is of the turbocompressor type, the rotor operating off the front end of the crankshaft through a decelerating gear of 1:1.5 ratio. The air and gas mixture is drawn into the supercharger from the carburetor, which has a 25-millimeter diaphragm, and discharged into the cylinders through a 30-millimeter tube. The supercharger supplies 375 cubic centimeters of mixture (theoretical supply) per rotor revolution at a pressure of 600 - 700 millimeters of mercury column.

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The transmission between the engine and the supercharger is equipped with a cone friction clutch, which acts as a damper. When the angular momentum surpasses the limit, the clutch begins to slip. A safety valve is placed on the T-joint.

Initially, the engine was tested under higher supercharger pressure. Using a 1:1.25 decelerating gear, the rotor velocity developed 900 - 1,000 millimeters of mercury column pressure. At this pressure the pistons and piston pins broke down.

The supercharger is lubricated through a line from the lubricant circulation system. The supply of lubricant is regulated by a hand-operated needle valve. Motor oil is mixed with the fuel in the proportion of one percent, thus ensuring lubrication of the inlet valves and of the cylinder heads.

To accommodate the supercharger at the front of the engine, the engine was moved back 90 millimeters.

The lubrication system was radically modified to increase the oil circulation and to improve the cooling of the lubricant. The conventional lubrication system has been replaced by a circulation system with a double gear-operated pump and a dry crankcase.

The oil tank has a 3.5-liter capacity and is attached to the frame under the saddle. The output of the part of the oil pump feeding the return circuit is twice as great as that which supplies the outgoing circuit.

Magneto rather than battery ignition is used. Spark plugs of incandescence No 280 gave best results.

The fuel tank was designed for long distance races. It was made of iron sheet and has a 30-liter capacity. The frame, the front fork and a few other parts are from the M-72. The gear shift is the standard M-72 type with a modified ratio for the top gear. The ratio being used when the record was established was  $i_4 = 4.32$ .

The racing weight of the motorcycle was 172 kilograms, without gas, but with full oil tank.

It is anticipated that work on the engine of the Kometa 2 will increase its speed even more.

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